

9. A particulate lithium titanate intercalation compound having particle sizes of less than 100 nm synthesized by a method comprising:

providing a homogeneous mixture of co-reactant precursors comprising nanostructure  $\text{TiO}_2$  and at least one thermolabile source of lithium ions;

heating said mixture rapidly to a reactive annealing temperature of about 750-800°C;

holding said mixture at said annealing temperature for a period of time not substantially longer than that required to effect the maximum available reaction of said mixed precursors in synthesizing said intercalation compound particles of less than 100 nm; and

cooling said synthesized particles rapidly to a temperature below the reaction temperature required for the synthesis of said intercalation compound, thereby preventing further growth of said particles.

Amend claim 10 to read as follows:

10. A rechargeable electrochemical cell comprising:

a negative electrode member comprising a first electrochemically active material;

a positive electrode member comprising a second electrochemically active material; and

a separator member comprising an electrolyte interposed between said negative and positive electrode members; wherein at least one of said active materials comprises a particulate zero strain lithium titanate intercalation compound having particle sizes of less than 100 nm.